Bar Mills Quadrangle, Maine

Surficial geologic mapping by Lewis E. Hunter

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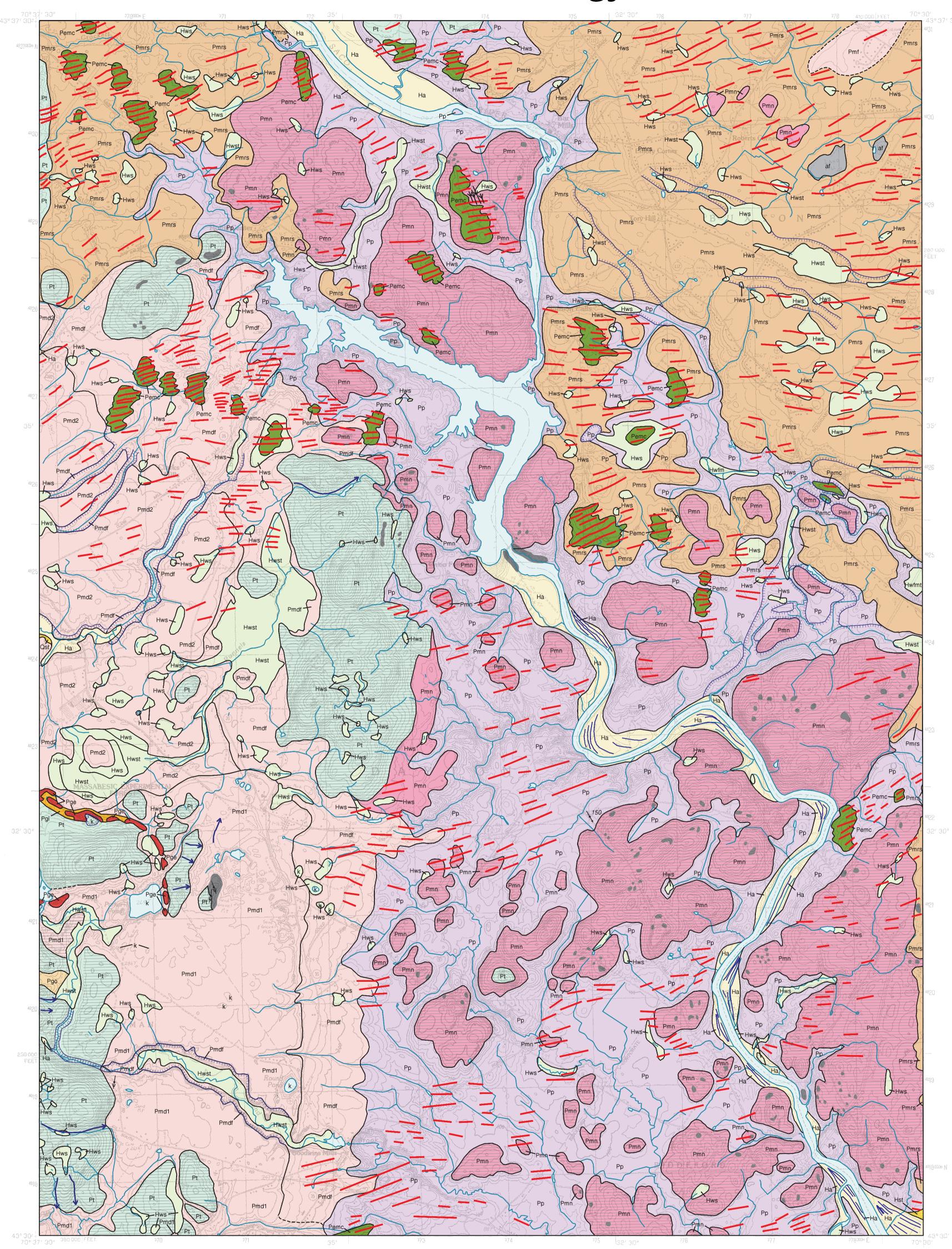
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For additional information, see Open-File Report 99-108.

Surficial Geology



SOURCES OF INFORMATION Surficial geologic mapping by Lewis E. Hunter completed during the 1987 field season; funding for this work provided by the U. S. Geological Survey COGEOMAP program. Wetlands data provided in part by Cornelia C. Cameron, U.S. Geological Survey, 1988. Geologic unit designations and contacts revised and



Quadrangle Location

SCALE 1:24,000 1 KILOMETER

CONTOUR INTERVAL 10 FEET

End moraine complex - Coarse till, gravel, sand, and silt associated with ridges

and mounds that formed at or near the front of a retreating marine-based glacier.

Mapped in areas of closely spaced (DeGeer) end moraines. Sediments are

Esker - Sinuous ridges comprised of stratified, coarse sand and gravel. Commonly

found at the heads of large glaciomarine deltas (Pmd). Deposited in subglacial and

Till - Poorly sorted mixture of gray to gray brown silt, sand, and gravel. Forms a

blanket deposit over bedrock and is inferred to underlie younger sediments where

Bedrock outcrops/thin-drift areas - Ruled pattern indicates area where surficial

sediments are generally less than 3 m thick. Gray areas and dots show individual

Flutes - Arrows indicate inferred flow direction of glacial ice (observed on aerial

Moraine crest - Linear or sinuous moraine ridges outcropping below the marine

limit. Composed of till, gravel, sand, and silt deposited at or near margin of

Meltwater channel - Channel eroded by glacial meltwater stream. Arrow shows

Meander scrolls - Flood plain deposits (observed on aerial photographs).

Ice flow indicators - Azimuth of glacial striations and roches moutonées.

not exposed at the surface. Commonly less than 3 m thick over bedrock highs.

Contact - Boundary between map units. Dashed where very approximate.

Scarp - Miscellaneous stream and river escarpments.

inferred direction of former stream flow.

retreating glacier. Barbs point in direction of former ice flow.

Kettle - Circular depressions in drift formed by ice-block meltout.

Ice-contact deposits - Sand and gravel deposited adjacent to glacial ice.

commonly deformed.

englacial meltwater tunnels.

Artificial fill - man-made landfill.

Topographic base from U.S. Geological Survey Bar Mills quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on

this map is for location purposes only and does not im-

pute responsibility for any present or potential effects on

Alluvium - Well-sorted and stratified sand, silt, and gravel. Comprises flood plains

matched to adjacent quadrangles in 1999 by MGS geologists.

along present streams and rivers. **Swamps*** - Muck, peat, silt, and sand (undifferentiated) in poorly drained areas. Hws Commonly associated with standing water.

Hwfm Freshwater marsh* - Poorly drained freshwater grassland. Hst Stream terrace deposits - Sand and gravel deposited on former flood plains in late-

glacial (Qst) or postglacial (Hst) time. Qst Nearshore deposits - Generally poorly-sorted mixture of silt, sand, and gravel formed by wave reworking of glacial sediments during marine regression.

Marine regressive sand deposits - Massive to stratified, well-sorted, gray to yellow-brown sand. Overlies Pp with gradational or interlaminated transition zone. Deposited through reworking of older glacial sediments during regressive phase of marine submergence.

Variable thickness; generally less than 3 m. Associated with paleobathymetric high.

Presumpscot Formation - Laminated to massive, gray to green-gray silt and clay. Occurs as a blanket deposit of variable thickness from 0 to 50 meters over older glacial deposits. May locally contain boulders, sand, and gravel. Deposited during

period of late-glacial marine submergence. Glaciofluvial outwash - Stratified sand, gravel, and some silt deposited by glacial Pgo

meltwater streams.

Pmd₂

Glaciomarine delta (undifferentiated) - Generally stratified fine to coarse sand and gravel. Surface topography is flat or slopes gently away from the paleoice margin. Formed by glacial stream discharge into late-glacial sea. Commonly exhibit kettles at the head-of-outwash marking former ice position. Pmd_1

Lyman Delta sequence: Glaciomarine delta sequence that constitutes first morphologic sequence in Bar Mills quadrangle. Deposited while ice margin was located at the southern portion of the Massabesic Experimental Forest The delta was fed by a chain of beaded eskers.

Hollis Delta sequence: Second morphologic sequence, deposited while the ice margin was located in the vicinity just south of Bear Hill. The delta was

Pmdf

Glaciomarine delta foresets - Steeply dipping (10-35°) stratified sand and gravel that grades into Pp down slope. Located along the seaward margin of Pmd, where the delta front slopes eastward, and also exposed where channels have been eroded in the deltas. The topset-foreset contact occurs at approximately 80 m above present sea level, marking the maximum limit of marine submergence.

fed by an esker chain to the west near the town of Waterboro.

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Ice flow indicators - Azimuth of crescentic gouges *NOTE: Wetland symbols followed by "t" indicate areas where peat deposits probably do not constitute a significant commercial resource, either because they are thin (< 1.5 m), or they have an ash content greater than 25 percent. Symbols followed by "p" indicate peat deposits that are thicker (generally > 1.5 m), with ash

content less than 25 percent, and thus may be suitable for commercial applications.

USES OF SURFICIAL GEOLOGY MAPS

the natural resources.

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to

human activity, such as fill or other land-modifying features. The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

- 1. Hunter, L. E., 1999, Surficial geology of the Bar Mills 7.5-minute quadrangle, York County, Maine: Maine Geological Survey, Open-File Report 99-108, 9 p.
- 2. Hunter, L. E., 1998, Surficial materials of the Bar Mills quadrangle, Maine: Maine Geological Survey, Open-File Map 98-179.
- 3. Neil, C. D., 1998, Significant sand and gravel aquifers of the Bar Mills quadrangle, Maine: Maine Geological Survey, Open-File Map 98-145.
- 4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print) 5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine
- Geological Survey, scale 1:500,000. 6. Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, in

Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological

Survey, Bulletin 40, p. 43-67.

Glaciomarine fan - Sand and gravel deposited in the sea as subaqueous fans at the margin of the last glacial ice sheet.